

Research Article

Translation and Psychometric Testing of the Arabic Version of the Problematic Media Use Measure Short Form for Children

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Background. There is growing concerns that excessive use of media among children will become problematic. Research on the management of children's problematic use of media would be improved if screening tools are widely applied. Problematic Media Use Measure Short Form (PMUM-SF) was developed to screen problematic use of media among 4- to 11-year-old US children. **Purpose.** The study is aimed at developing and validating a cross-cultural version of the PMUM-SF for use in Arabic-speaking parents of children from age 3 to 13 years. **Design.** Cross-cultural adaptation and cross-sectional psychometric testing study. **Methods.** Using the World Health Organization (WHO) framework for instrument translation and adaptation, the instrument was translated, back translated, pretested, and reviewed by a committee. The PMUM-SF was tested in 180 parents of children aging from 3 to 13 years. **Results.** The results demonstrated that the Arabic version of the PMUM-SF had high reliability (Cronbach's alpha was 0.90); it has good convergent and predictive validity. The factor structure of the Arabic version of PMUM-SF was confirmed through exploratory and confirmatory factor analysis (comparative fit index (CFI) = 0.93; goodness of fit index (GFI) = 0.90; incremental fit index (IFI) = 0.93). **Conclusion.** Because the Arabic version of the PMUM-SF seems to be reliable and valid in assessing problematic use of media of children in Arabic-speaking parents, the use of this translated version is recommended in future research.

1. Introduction

There is a continuous rise in media consumption among the current youths [1]. Media is currently a central part of children's life [2]. Even children from economically challenged households use new technologies such as smart phones and other interactive media [3]. The use of media is rapidly permeating the households across the globe. An international comparison of children's use of media showed that children from Arabic regions had high rates of mobile use [4]. Bahraini children, for example, documented the highest rates of mobile phone use when compared with children from Japan, Philippines, and Honduras [4]. Another report which investigated the use of mobile phones among children

from Algeria, Egypt, Saudi Arabia, and Iraq revealed that 81% of children use mobile phones; the highest rates of use were among children from Saudi Arabia (85%) [5].

Nevertheless, the majority of children all over the world exceed the recommended limits of healthy media use [6]. Thus, there is growing concerns that the use of media will become problematic [7]. In the USA, children of age 8-12 years spend an average of 5 hours a day on entertainment screen media; teens spend even more time with an average of about seven hours a day [6]. Similar or higher trends of media use among children were reported in the Middle East Arabic regions. Children in Saudi Arabia start using screen media devices before the age of two [8]. Saudi toddlers spend an average of 3 hours daily watching TV and using screen

media devices [8]. Older school age Saudi children are also demonstrating continuous rise in the use of media; they spend an average of 35 hours weekly using different media devices [9]. However, despite the increasing prevalence of screen media use among Arab children, organizations and societies in the Arab world lag behind western and American organizations in providing data and recommendations that control media use for different age groups [8]. There is also scant research body that describes the prevalence and patterns of media use across different Arabic countries.

Such rapid global expansion of media landscape constitutes a challenge for researchers who attempt to assess young children use of media and its effect on their health [10]. Researchers propose that the effect of media on children's health depends on the context and content of media use [2, 11]. Many contextual and cultural factors such as child race and ethnicity might account for the variations in research findings about the patterns and rate of media use and the effect of media on child health [11, 12]. Within this context, culture plays a vital role in shaping parents' positive or negative beliefs and attitudes toward the use of media among their children [11]. Parents' beliefs about technology and media have an impact on the quantity and quality of media use among children [13]. Parents who have positive attitude toward technology tend to adopt less restrictive rules regarding children use of media than parents who have negative attitudes toward technology [13]. For example, researchers pointed that the excessive use of media among Saudi children might be associated with the low prevalence of daily reading since the culture of reading for pleasure is not common among Saudi parents [8]. The studies also showed that there is a difference in the content viewed by children across different regions in the world. For example, the content viewed by the majority of Saudi and Turkish children was songs and entertainment apps; educational apps and games were viewed less frequently [8, 14]. On the other hand, Greek children use educational apps more frequently [13]. Thus, it is not reasonable to generalize the findings of research from western world about problematic use of media into Arabic world. As such, Barr et al. [11] emphasized the importance of investigating the context and content of child media use; and to capture the contextual factors of child use of media, tools need to be developed or translated into different languages.

Researchers have extensively investigated the dysfunctional behavior related to the use of screen media devices through scale development and administration [7, 11]. Research on the management of children's problematic use of media would be improved if screening tools are widely applied [15]. However, there is an overall limited research about problematic use of media and standardized conceptualization of problematic media use and cutoff points that determine it have not been established yet [7, 15]. Lack of consensus about the definition of problematic media use led to variation in the theoretical foundation of its assessment tools [7]. Literature showed that many assessment tools measure problematic use of media based on amount and patterns of use, while other assessment tools

depend on the negative consequences associated with excessive use of media [7].

However, most of standard measures have been developed for English-speaking population. As such, tools' reliability and validity may be limited in terms of assessing problematic use of media among Arab children, as different cultures might have different views on the purpose and importance of media use. Nevertheless, reinventing the wheel by developing new tools while standard tools are available is not recommended.

Using assessment tools would facilitate early screening of problematic use of media; early screening is vital for early detection of the problem which facilitate early intervention. It is vital to intervene in a timely and effective manner since the excessive use of visual screen media is associated with multiple negative physical, psychoneurological, and social outcomes among children [2, 10, 16].

The Problematic Media Use Measure Short Form (PMUM-SF) is a self-administered questionnaire; it is a short form derived from the 27-item Problematic Media Use Measure (PMUM). It is the first developed tool to be used by parents to report their children's problematic use of media. The clinicians are recommended to use this tool to screen media addiction in children aging from 4 to 11 years [15]. The tools' items were based on the 9 criteria for Internet gaming disorder in the DSM-5 [15]. In the last decade, Diagnostic and Statistical Manual of Mental Disorders [17] and International Classification of Diseases [18] have included behavioral addictions such as Internet gaming addiction within addictive disorder category. Literature showed that Internet gaming addiction criteria have underlain many screen and media behavioral problems such as social media addiction [7].

There is currently no validated translation of the PMUM-SF into Arabic. In light of lack of Arabic version of PMUM-SF, there is particular value for such cross-cultural studies to translate a validated Arabic version of the PMUM-SF. The purpose of this study was to describe the process used to translate and test the adequacy of the Arabic language version of the PMUM-SF for children.

2. Materials and Methods

The tool was translated using WHO framework for instrument translation and adaptation. This framework provides the researchers a standard protocol that was robustly followed during tool translation and adaptation process in this study. Unfortunately, some researchers borrow the tools assuming its relevance on a variety of societies, rather than measuring its suitability and psychometric properties in different contexts and communities. Thus, the feasibility, acceptability, and literacy congruency of PMUM-SF were examined using the WHO framework for instrument translation and adaptation. This framework focuses on conceptual equivalence rather than on verbatim translation. The framework consists of five steps: forward translation, expert panel, blind back translation, pretesting and cognitive interview, and pilot testing for the final version.

2.1. Forward Translation. Arabic-speaking people in the Middle East are a heterogeneous group living in different countries in the Arab world. Despite the fact that these people have different colloquialisms, they have standard written Arabic. Standard Arabic uses basic vocabulary, grammar, and syntax that are understood by most Arabic speakers irrespective of national origin, considering conceptual meaning of the items not the literal translation. Two translations from English to Arabic were performed by two independent professional translators whose mother tongue was Arabic. This allowed detection of errors and discrepancies in translating ambiguous items in the original instrument. A reconciliation of the two forward translations was performed.

2.2. Expert Panel. According to the WHO framework, the experts were selected based on their qualifications. A committee consisted of five bilingual members from Jordanian universities (2 pediatric nurses with PhD, 1 pediatric nurse with master degree, and 2 bilingual translators whose mother tongue is Arabic). The committee reviewed the forward translated versions to reach a decision about word clarity, appropriateness, expression adequacy, and sentence editing through comparing it to the original version. After discussion, minor changes were made to some items; the final modified and approved version of the translated tool was ready for back translation.

2.3. Blind Back Translation. The final Arabic version was given to two independent translators who translated it back to English. The two translators were not aware about the tool and had no prior knowledge about PMUM-SF. This ensured that the translators are free from biases and expectations and their back translations might reveal unexpected meanings and translations. Then, the back translated version was sent to the developer of the original tool for approval, where no discrepancies were found.

2.4. Pretesting and Cognitive Interview. The Arabic version of the tool was distributed electronically and pretested by 20 parents who have children aging from 3 to 13 years. Electronic distribution of the tool makes it difficult for the participants to meet in a focus group to debrief their answers and share their opinions regarding the translated version of the tool. Therefore, each parent was asked after completing the scale to provide comments about the scale and to identify any words or items that were difficult to understand. Based on these comments, very minor changes were made. Three iterated versions of Arabic PMUM-SF were made to present the final version.

2.5. Participants. The study was conducted using an online questionnaire which was developed using Google Forms. The data was collected over a period of 4 months from January 2021 to December 2021. A convenient sample of caregivers of children aging from 3 to 13 years from twelve governance in Jordan (Arabic-speaking country) participated in the study and completed the online questionnaire. One hundred and eighty parents were enrolled in the study over a period of 4 months. The online ques-

tionnaire was distributed through different national Facebook and WhatsApp groups that had a large number of followers and members. The questionnaire was sent to a number of groups and pages as a post with information about the purpose of the study, target population, and voluntary participation. The participants were not offered a compensation for their participation in the research. Parents reported their child's sex and age; they also reported their child's average weekday and weekend screen time. The average of screen media use time (hours/day) was derived by calculating weighted average for weekday and weekend responses ($[\text{weekday} * 5 + \text{weekend} * 2]/7$). Table 1 summarizes the demographic characteristics of the study participants.

We used one item to assess parents' worry about their child's use of screen media: "how often do you worry about your child's screen media use (computer, mobile device, TV, or video games)?" [15]. Response options were scored on a scale of 1 = never, 2 = rarely, 3 = sometimes, 4 = very often, and 5 = always. To assess parent and child conflict about the use of screen media, we used one item: "how often do you have a conflict with your child because your child has to turn off" [15]. Parents answered the question on a scale that ranged from "once a year or never" to "many times a day."

2.6. Instrument. The instrument consisted of two parts, i.e., the Demographic Data Form and the Questionnaire of the Problematic Media Use Measure Short Form (PMUM-SF). The PMUM-SF consisted of 9 items; the mean of all items (9 items) is calculated to provide a total score [15]. Nine Likert-type items addressed the problematic use of media with each item scored on a scale of 1 = never, 2 = rarely, 3 = sometimes, 4 = very often, and 5 = always [15]. The higher the mean score, the higher the level of problematic use of media.

The original English version of the scale has high internal consistency ($\alpha = 0.93$) [15]. The original scale's total score was significantly correlated with total screen time, parent worry about child media use, and parent-child conflict with turning off device which supported the scale's convergent validity [15]. This nine-item scale is a short form derived from the 27-item scale. The construct validity of the short form was confirmed through conducting a confirmatory factor analysis for the factor structure that resulted from the exploratory factor analysis. The results revealed acceptable model fit (RMSEA = 0.085; CFI = 0.961; SRMR = 0.024) [15].

Tool items include such items as follows: screen media is all that my child seems to think about; the amount of time my child wants to use screen media keeps increasing; and my child becomes frustrated when he/she cannot use screen media.

2.7. Ethical Consideration. Ethical permission to conduct the study was obtained from the scientific research committee at the Department of Nursing at Al-Hussein Bin Talal University. Before beginning the research product, an agreement was obtained from the developer of the original tool Sarah

TABLE 1: Participant demographic characteristics.

Demographic variable	Mean (SD) or % (<i>n</i>)
Child age (years)	7.5 (3)
Child sex (male)	56.3% (108)
Family income	
100-399 JD	16.1% (31)
400-699 JD	30.7% (59)
700-999 JD	24.5% (47)
1000-1500 JD	17.7% (34)
>1500 JD	10.9% (21)
Educational level of the parents	
Undergraduate	20.3% (39)
Diploma	8.3% (16)
Graduate	45.3% (87)
Postgraduate	25.5% (49)
Daily screen time (hours)	
School days	3.1 (2.1)
Weekends	5 (2.8)

E. Domoff. Parents were informed through the post and a questionnaire cover page about voluntary and anonymous nature of the study. Returning the questionnaire was considered as a written informed consent.

2.8. Reliability. The internal consistency reliability for this study was measured in many ways: Cronbach's alpha for the scale, Cronbach's alpha for the scale if a single item is removed, correlations between an item and the remaining items in the measure (corrected item-scale correlations). Cronbach's alpha is a statistic used to calculate the mean of all split-half combinations. The internal consistency of scale relates to its homogeneity. The researchers were unable to conduct test retest reliability since an online questionnaire was used and the researchers were unable to reach to parents who filled the scale again.

2.9. Validity. Construct validity was investigated by measuring predictive and convergent validity. A predictive validity was measured by estimating the correlation between PMUM-SF and total daily screen time. Correlations between the PMUM-SF and the one-item "worry about child's media use" was estimated to measure convergent validity. The construct validity was also confirmed by conducting confirmatory factor analysis. We began with confirmatory factor analysis since the model we are testing was based a combination of prior theory and empirical work [19]. Fokkema and Greiff [19] reported that performing exploratory and confirmatory factor analysis on the same data set carries a threat of overfitting the model. As criteria for CFA model fit, the researcher suggested that the close fit is indicated by CFI, NFI, IFI, and TLI > 0.95 [20].

3. Results

3.1. Data Screening. The analysis was conducted with SPSS statistical package and IBM SPSS AMOS 26. Before starting the data analyses, the data were screened to determine missing data and entry errors. Each variable was checked care-

fully for missing data and for outliers. However, the flaws in data were rare; no cases were excluded from analysis because of missing data. Single imputation approach was followed; that is, missing data were replaced by means. Histograms and frequency tables were generated to assess for mean, median, mode, and skewness to judge for normality of distribution for the continuous variables. As preliminary analysis, the data were checked for meeting the assumptions of the utilized tests. The data were checked for the level of measurement and for the normality of distribution. Pallant [21] discussed that in many studies, in the social sciences in particular, the scores on the dependent variable are not usually normally distributed, which violates a necessary assumption for the application of parametric tests. Nevertheless, Gravetter and Wallnau [22] and Stevens [23] pointed that the violation of normality of distribution assumption would not cause any major problem if the sample size is adequately large, such as larger than 30. More to the point, the value of skewness between -2 and +2 is considered acceptable to consider normal distribution [22]. We have a relatively large sample size, and the data of all variables (each item, total scale score, and total screen time) were approximately normally distributed with skewness between -2 and +2. This implies no serious violation of normality of distribution assumption in the current study.

The mean score of the total of the averages of nine items was 3.05 out of 5, and the standard deviation was 0.87. The total of the averages of nine items ranged from 1 to 5. The highest score among the 9 items was for "my child sneaks using screen media" (3.60 out of 5).

3.2. Reliability. Internal consistency reliability for this study was measured in many ways: Cronbach's alpha for the scale, Cronbach's alpha for the scale if a single item is removed, correlations between an item and the remaining items in the measure (corrected item-scale correlations). Reliability estimated by the internal consistency reached a Cronbach's alpha of 0.90. The interitem correlations are all between 0.34 and 0.76. Of all items, only one item "my child sneaks using screen media" makes a meaningful impact on change in reliability (+0.08); this item has also the lowest corrected item correlation (=0.34). Table 2 presents the participants' scores' means and standard deviations for each item and Cronbach's alpha if individual items are removed and the corrected item-scale correlations in the 9-item scale.

3.3. Confirmatory Factor Analysis. A confirmatory factor analysis was conducted to test the factor structure of the Arabic version of PMUM-SF. To achieve model identification, regression coefficients of the error terms over the endogenous variables were fixed to 1. Overall; the one factor model demonstrated a good fit to the data; comparative fit index (CFI) = 0.93; goodness of fit index (GFI) = 0.90; incremental fit index (IFI) = 0.93; normal fit index (NFI) = 0.90; and Tucker-Lewis index (TLI) = 0.90; see Table 3.

Eight items in the scale loaded saliently on the factor (above 0.65); however, one item ("my child sneaks using screen media") had a significant but low loading on the

TABLE 2: Scale statistics.

Item number	Items in English	Items in Arabic	Mean	Standard deviation	Corrected item-total correlation	Cronbach's alpha if item deleted
1	My child sneaks using screen media.	يتسول للطفل لئلا يسرع عمل وسائط الشاشة الجارية	3.60	0.89	0.34	0.91
2	Screen media is all that my child seems to think about.	الوسائط الجارية هي كل ما يبدو أن طفلي يفكر في	3.36	1.09	0.73	0.89
3	It is hard for my child to stop using screen media.	من الصعب على طفلي التوقف عن استعمال وسائط الشاشة الجارية	3.06	1.14	0.75	0.89
4	When my child has had a bad day, screen media seems to be the only thing that helps him/her feel better.	عندما يمر طفلي بيوم سيء يبدو أن الشيء الوحيد الذي يشعره بتحسّن هو وسائط الشاشة الجارية	3.05	1.28	0.71	0.89
5	My child's screen media use causes problems for the family.	استخدام طفلي وسائط الشاشة الجارية يتسبب بمشاكل للعائلة	2.71	1.19	0.66	0.89
6	The amount of time my child wants to use screen media keeps increasing.	يتزايد مقدار الوقت الذي يريد طفلي فيه استعمال وسائط الشاشة الجارية	3.18	1.17	0.76	0.88
7	Screen media is the only thing that seems to motivate my child.	يبدو أن وسائط الشاشة الجارية هي الشيء الوحيد القادر على تحفيز طفلي	2.68	1.24	0.63	0.89
8	My child becomes frustrated when he/she cannot use screen media.	يشعر طفلي بالإحباط حين لا يتمكن من استعمال وسائط الشاشة الجارية	2.95	1.23	0.72	0.89
9	My child's screen media use interferes with family activities.	استخدام طفلي وسائط الشاشة الجارية يتعارض وقيامه بالأنشطة الأسرية	2.84	1.19	0.72	0.89

TABLE 3: Goodness of fit indices.

χ^2	d.f.*	p^*	$\chi^2/d.f.*$	GFI*	AGFI*	CFI*	IFI*	RMSEA*
92.3	27	<0.01	3.42	0.90	0.84	0.93	0.93	0.11

$\chi^2/d.f.*$: relative chi-square; GFI: goodness of fit index; AGFI: adjusted GFI; CFI: comparative fit index; IFI: increment fit index; RMSEA: root mean square error of approximation.

factor (0.37); see Figure 1 that shows the standardized path coefficients.

3.4. Convergent Validity. Convergent validity was measured by estimating the relationship between the PMUM-SF and the one-item “worry about child’s media use” and one item “conflict with the child about media use.” The correlations of the total PMUM-SF score with one-item “worry about child’s media use” and one item “conflict with the child about media use” were significant ($r = 0.22$, $p = 0.002$; $r = 0.37$, $p \leq 0.001$). Predictive validity was measured by estimating the relationship between PMUM-SF total score and daily screen time. The correlation between total PMUM-SF and daily screen time was significant ($r = 0.43$, $p < 0.001$).

4. Discussion

Societal and cultural contexts are important determinants of the patterns of media use across countries [24]. The need for cross-cultural studies and the need for measures that capture such contextual factors have been emphasized [11, 24]. The findings of the current study might contribute in addressing such issues particularly among Arab children. This report discusses the translation of PMUM-SF scale into Arabic and describes preliminary psychomet-

ric testing. The PMUM-SF scale is used for measuring the problematic use of media among children [15]. ([15]) in their study have recommended to validate PMUM-SF in diverse population. However, and up to our best knowledge, this is the first study that has examined the psychometric properties of the PMUM-SF in a sample of parents of children aging from 3 to 13 years in the Arab world. The purpose of the current study was to translate and test the reliability and validity of PMUM-SF in a sample of children between the ages of 3 and 13 years.

The results of this study demonstrated that this translated instrument is both valid and reliable. Overall, the Arabic version of PMUM-SF revealed similar psychometric properties as those of the original report. Cronbach alpha was almost equal in both studies. Significant correlations were found between the total PMUM-SF score and the parents’ child conflict about media use and the parents’ worry about their child use of media which support the instrument’s convergent validity. Incremental validity was demonstrated as well, with the PMUM-SF predicting children’s total over and above hours of screen time.

As many other scales that measure the problematic use of media [7], PMUM-SF was based on DSM-5 Internet gaming addiction criteria [15]. The domain of content of the PMUM-SF is related to the following Internet gaming

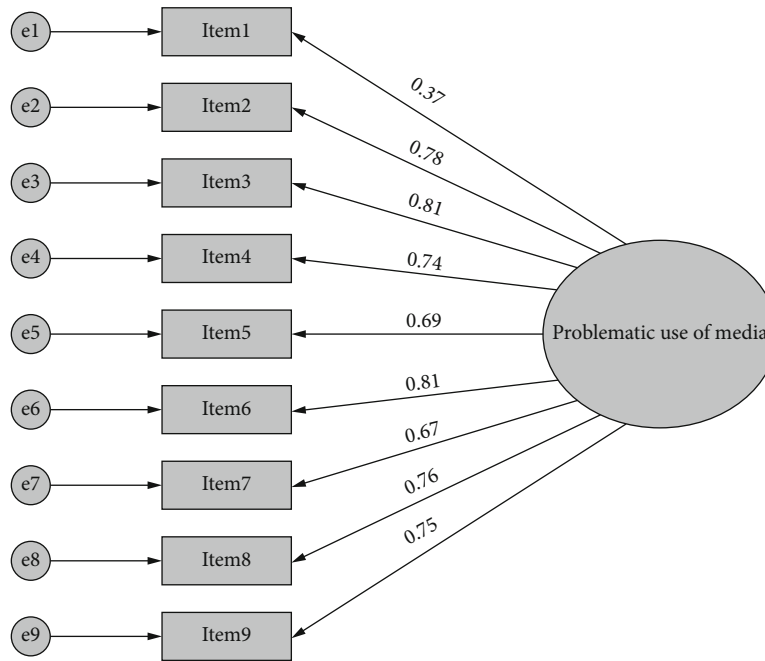


FIGURE 1: Confirmatory factor analysis of Arabic version of problematic use of media scale ($N = 180$).

addiction criteria items [17]: preoccupation, withdrawal, tolerance, parent unsuccessful attempts to control child's use of media, child loss of interest in previous hobbies and activities, deceiving others about media use, using media to escape or relieve a negative mood, jeopardizing/losing a relationship or had compromised functioning in school due to use, and continued use despite psychosocial problems [15]. After conducting confirmatory factor analysis, the unidimensional structure of the questionnaire was not altered and the 9 items were maintained. All the items had high factor loadings ranging from 0.42 to 0.83, which supports the unidimensionality of this scale. Nevertheless, the removal of the first item in the measure ("my child sneaks using screen media") had slightly improved the reliability of the scale.

Overall, goodness of fit indices in confirmatory factor analysis supported relatively good model fit. However, to discuss the model fit of confirmatory factor analysis, the criteria of the various model fit indices should be considered. [25] reported that RMSEA values of less than 0.05 indicate good model fit, values between 0.05 and 0.08 indicate acceptable model fit, and values between 0.08 and 0.1 indicate marginal model fit while values of more than 0.1 indicate poor model fit. Therefore, RMSEA in the current study (0.1) indicate a marginal model fit. The CFI value is 0.93, which shows a good fit [26]. For good convergent validity, factor loadings should be equal to or more than 0.707 [27]. The confirmatory factor analysis results of this study showed that 6 items had loading greater than 0.707 and 3 items had loading less than 0.707.

Overall, the instrument appears to be understood and easily administered to Arabic-speaking parents from different national origins. The Arabic version of PMUM-SF has many features for clinicians and researchers. It takes a short time to complete by parents of children who cannot report

about media use by themselves [15]. It also uses an inclusive term "screen media" to screen the children's problematic use of many devices such as video games, mobile phones, tablets, and other devices rather than screening the problematic use of specific device. This is particularly advantageous since children are currently using diverse media platforms [1, 15].

There are few researches that describe the prevalence and patterns of media use among Arab children. However, it seems that the prevalence and intensity of screen media use among them are escalating. Translating the tool into different languages might contribute to the global literature by increasing our understanding of the phenomena of problematic use of media. Using the Arabic version of PMUM-SF would also help the clinicians and the researchers to screen children for the problematic use of media. This in turn might raise the awareness of national health and technology organizations to set forth guidelines that control children use of screen media.

Also, research revealed that parenting practices regarding screen media use restriction were associated with less screen time among children [28]. However, parents usually fail in enforcing rules and restrictions that control their children's use of media [1]. Supporting the parents' beliefs about problematic use of media through using this simple tool might increase their self-efficacy in enforcing screen media restriction rules [28]. Using such simple screening tools might increase the parents' perception and awareness about the problematic use of media so they become more assertive in enforcing boundaries around their children's use of screen media.

The results of the current study should be interpreted within its limitations such as cross-sectional design of the study. Additionally, PMUM-SF is a self-report measure which might be associated with social desirability bias.

Another limitation is using online questionnaire which might generate sampling bias.

Based in the aforementioned results, we recommend further research to translate the full-scale version (27-item version) into Arabic and then to conduct exploratory and confirmatory factor analysis to get the best model and best model fit.

5. Conclusion

The results of the current study demonstrated that it is possible to translate PMUM-SF into Arabic without losing the psychometric properties of the original English version. Thus, translating existing tools appears to be feasible and apparently much more efficient than developing new tools. The Arabic version of PMUM-SF seems to be a reliable and valid tool for assessing the problematic use of media among Arab children. Thus, the use of this translated version is recommended in future research.

Data Availability

The data that support the findings of this study are available on request from the corresponding author, Doa'a Dwairej. The data are not publicly available due to their containing information that could compromise the privacy of research participants.

Conflicts of Interest

There is no conflict of interest.

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